REMARKS

Claims 1-10 are pending in the application. Claims 1-10 stand rejected. Claim 1 has been amended. Reconsideration and allowance of Claims 1-10 in view of the above amendment and following remarks is respectfully requested.

Rejection of Claims 1-10 under 35 U.S.C. §103(a)

Claims 1-10 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,565,763, issued to Asakawa et al. (Asakawa) in view of EP 1202365, issued to Yamaguchi et al. (Yamaguchi) Withdrawal of the rejection is respectfully requested for the following reasons.

Claim 1 has been amended to clarify that pores of the porous substrate are filled with a first polymer having proton conductivity, thereby to impart proton conductivity to the electrolyte membrane. The Amendment is based on the whole of the originally-filed specification and claims.

As now amended, Claim 1 relates to an electrolyte membrane including a porous substrate having the following characteristics,

(A) pores of the porous substrate are filled with a first polymer having proton conductivity, thereby to impart proton conductivity to the electrolyte membrane, and

(B) the porous substrate is comprised of i) a second polymer which is selected from the polyolefins, and crosslinked with each other, and ii) a third polymer having a double bond in the molecule.

Claims 9-10 depend from Claim 1.

The Asakawa reference describes a pattern forming material which contains a block copolymer or graft copolymer and forms a structure having micro polymer phases. The block copolymer or graft copolymer comprises a polymer chain whose main chain can be cut by irradiation with an energy beam and a polymer chain that is resistant to decomposition when irradiated with an energy beam, such as polyethylene. According to Asakawa, a polymer chain

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may have a double bond, and may be capable of crosslinking by irradiation with the energy beam. The polymer chain whose main chain has been cut by irradiation with the energy beam can be removed by means of wet etching such as rinsing with a solvent or by evaporation by heat treatment. (Column 13, lines 7-17) Alternatively, the block copolymer or graft copolymer can include a thermally decomposable polymer chain and a heat resistant polymer chain. (Column 15, 41-45)

The Yamaguchi reference discloses an electrolyte membrane made of a porous substrate filled with a polymer having proton conductivity. The monomers used to make polymers filling the holes in the porous substrate can be acrylic acid (AA) (column 4, line 16), or monomers having vinyl groups and strong acid groups such as sulfonic acid (column 4, lines 15-16).

While admitting that the Asakawa reference fails to disclose that pores of the porous substrate are filled with a first polymer having proton conductivity, the Examiner states that the Yamaguchi reference teaches a porous electrolytic membrane for fuel cell wherein the pores of the porous substrate are filled with a first polymer having proton conductivity. The Examiner then concludes that it would have been obvious to one having ordinary skill in the art to provide the Asakawa reference with the pores that are filled with a first polymer having proton conductivity in order to integrate the cathode and electrolyte so that the integrated product may facilitate the handling of the thin electrolyte membrane as taught by the Yamaguchi reference. Applicants respectfully disagree.

There is no basis in either the Asakawa reference or the Yamaguchi reference for combining the teachings in the two references. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984) The Aasakawa reference discloses a porous polymeric material with patterned holes. The Yamaguchi reference discloses an electrolyte membrane comprising a substrate made of glass, ceramics, Teflon™ or polyimide

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(column 3, Lines 21-27) and a hole-filling polymer. There is no suggestion or motivation in either the cited references or the prior art to fill the holes in Asakawa's patterned material with a polymer, as suggested by the Examiner.

The cited references are not properly combinable because modifying the pattern forming material in the Asakawa reference by filling the holes in the material would destroy the intended function of the material. The Asakawa reference teaches a material that is capable of forming a pattern of the order of nanometers in a self-organized manner on a substrate, the pattern being utilized as a mask for forming a nanopattern excellent in regularity. (Column 1, lines 7-10) The object of the Asakawa reference is to provide a pattern forming materials. Therefore, the holes that form the pattern in the material are desirable and necessary. Filling the holes in the patterned material would defeat the purpose of the material. Therefore, there is not only no technological motivation, but also disincentive to engage in the modification of hole filing in the Asakawa reference.

The cited references are from nonanalogous art and deal with different problems, further defeating *prima facie* obviousness. The Asakawa reference discloses pattern forming material. It is an object of the Asakawa reference to provide a pattern forming material and a method for forming a pattern, which has high process throughput and is capable of forming a planar pattern or three-dimensional structure of the order of nanometers having considerable regularity. (Column 2, lines 6-11) On the other hand, the Yamaguchi reference discloses an electrolytic membrane for fuel cell. The object of the Yamaguchi invention is to implement an electrolyte membrane that has greatly reduced methanol crossover and is stable in a high-temperature environment. The two references are from different industrial fields and address different problems. Therefore, a person skilled in the art would not be motivated to combine the two cited references to arrive at the claimed invention.

By using a porous substrate, wherein pores of the porous substrate are filled with a first polymer having proton conductivity, whereby to impart proton conductivity to an electrolyte

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membrane, and the porous substrate is composed with a crosslinked polymer (a second polymer) and a double bond containing polymer (a third polymer), the claimed invention achieves the advantage of a) the inhibition of permeation of methanol for the electrolyte membrane, and b) no or reduced change in surface area followed by wetting with a solution and/or by drying at starting and stopping of the polymer electrolyte fuel cell using methanol fuel. The cited references do not disclose nor suggest the claimed invention nor the advantages achieved by the claimed invention. Because the cited references fail to teach, suggest, provide any motivation to make, or otherwise render obvious the invention that is now claimed, the claimed invention is nonobvious and patentable over the cited references. Withdrawal of the rejection is respectfully requested.

CONCLUSION

In view of the above amendments and foregoing remarks, applicants believe that Claims 1-10 are in condition for allowance. If any issue remains that may be expeditiously addressed in a telephone interview, the Examiner is encouraged to telephone applicants' attorney at the number listed below.

Respectfully submitted,

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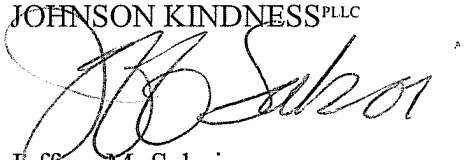

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